

SQL Part 1 (Setup & Intro)

Graduate Fellow

Agenda

SQL Overview

MySQL Overview

DataGrip Overview

Resources

Contact Info

Steps

1. Download MySQL: <https://dev.mysql.com/downloads/workbench/> (free)
2. Download DataGrip: <https://www.jetbrains.com/datagrip/> (you can use 30-day trial)
3. (optional) get license for DataGrip:
<https://www.jetbrains.com/community/education/#students> (good for a year)

If you want to...

See data

Relationship between data

Find any cell

Add data to cells

To add order to information

SQL Overview

Structured Query Language

Crud: create, read, update, delete

- Create databases and tables
- Look at specific data
- Make changes to data and remove data
- And more (level 2)

Relational Databases

A collection of tables

Set of columns in each table
and rows with data

Each row is called a **record**

Data between tables can be
related between each other

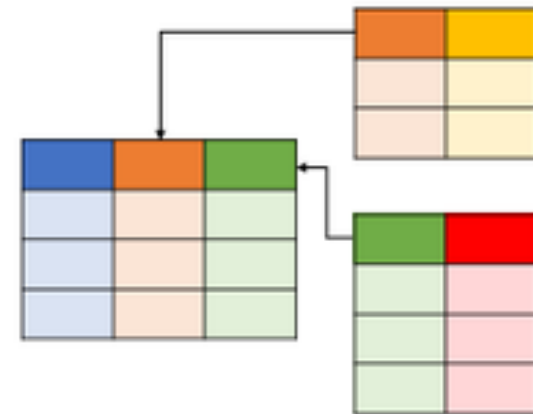


Collection of tables is called **schema**

SQL DATABASES

Relational
Database
management
system

ACID compliant:
(Atomicity,
Consistency,
Isolation, and
Durability)



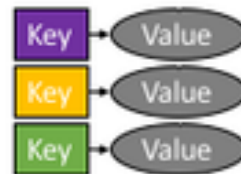
Relational

Vertically Scalable
Fixed or predefined Schema
Used for complex queries

NoSQL DATABASES



Column



Key-Value

Dynamic Scalable
Dynamic Schema
Not good for complex queries



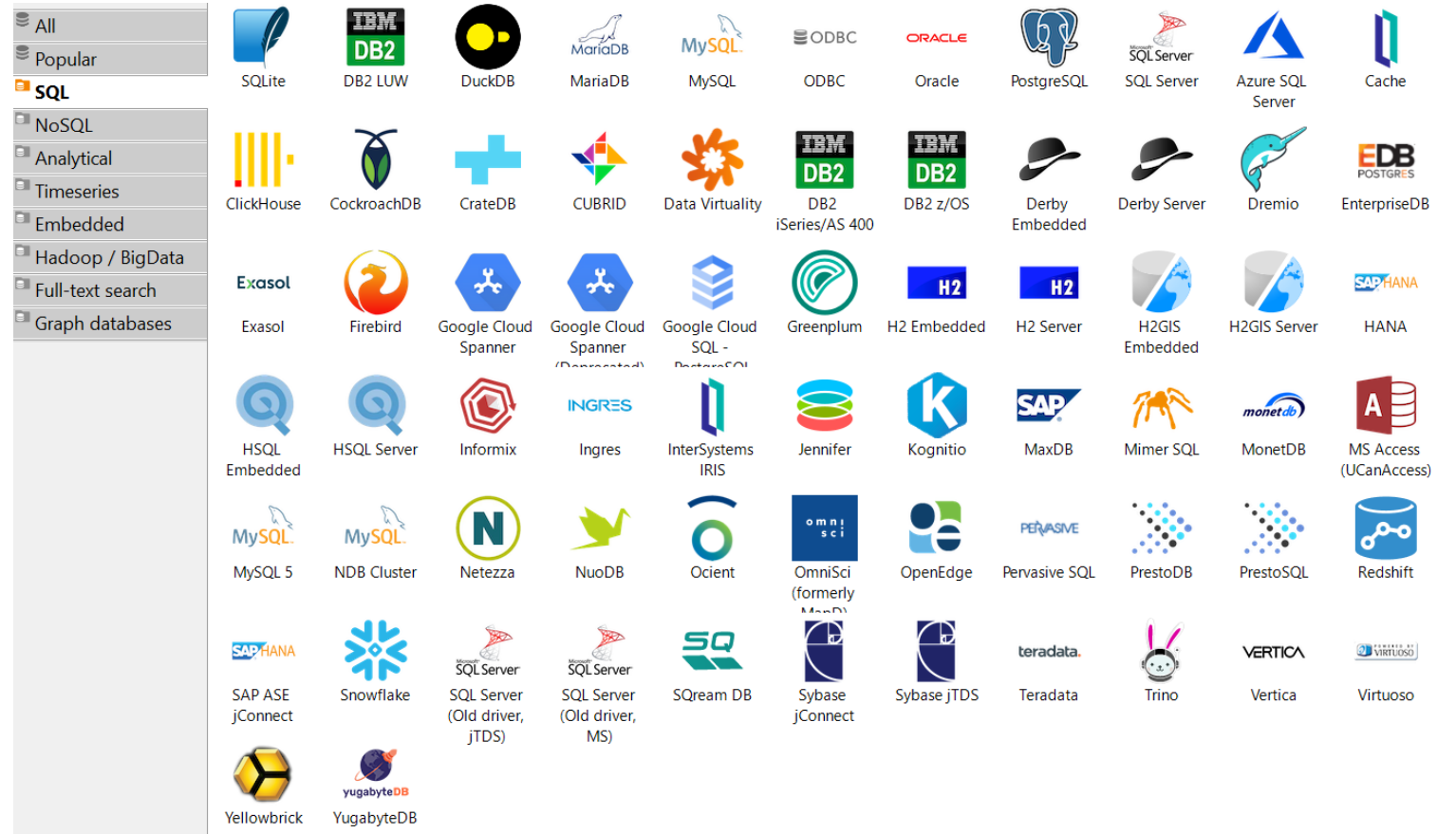
Graph



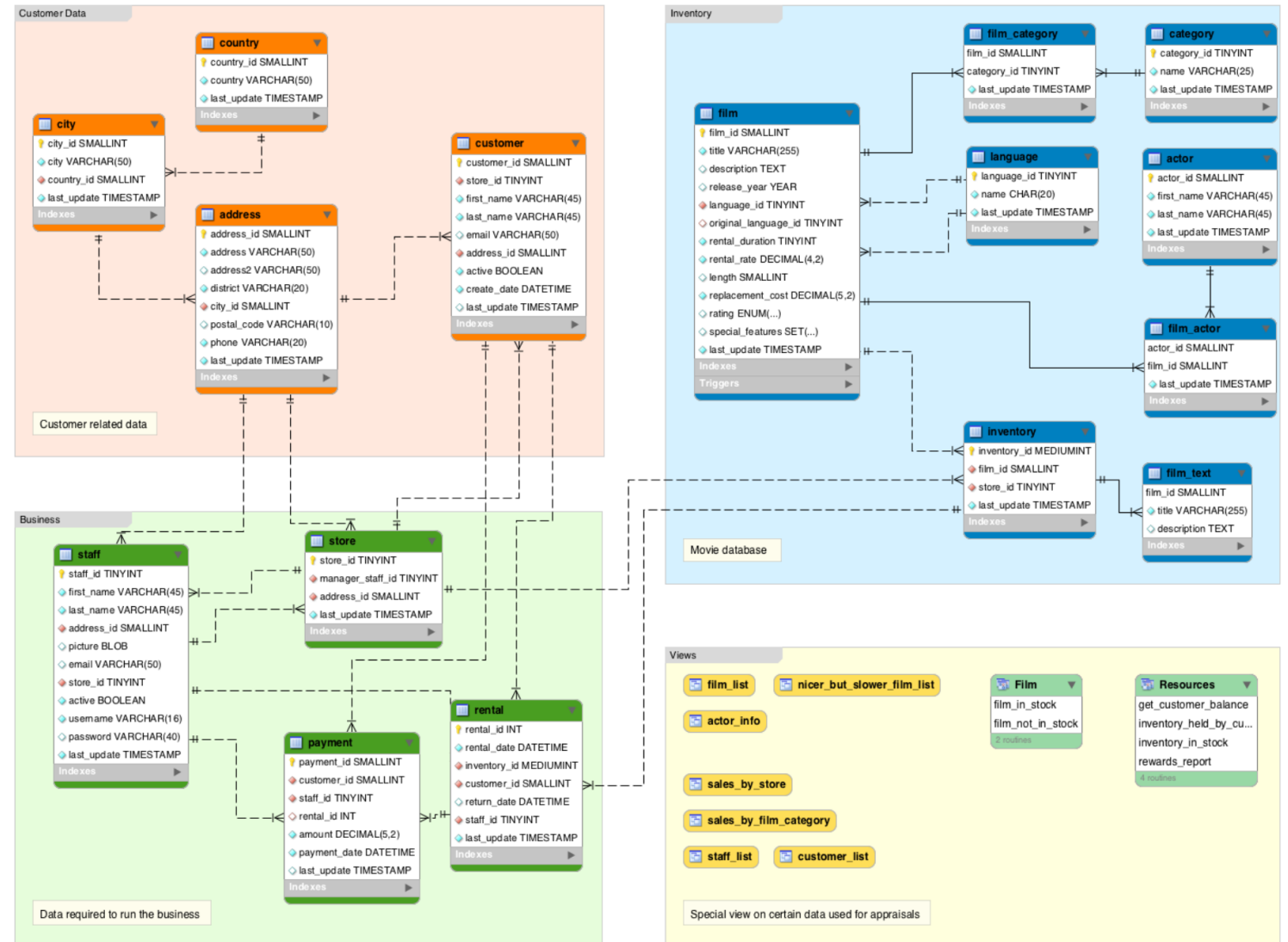
Document

CAP Theorem:
Consistency,
Availability,
Partitioning

Relational SQL Databases



Schema Example - Entity Relationship Diagram (ERD)



A database schema diagram of the Sakila Sample Database.

Relational DBMS

Courses_Students

ID	ClassID	Semester
71225	1005	Fall21
86634	1006	Spr22
32238	1009	Spr22

School_Courses

ClassID	Title	ClassNum
1005	Intro to Art History	500
1006	Intro to SQL	501
1009	Intro to Databases	300

Students_Attendees

ID	Name	Grade	DOB
71225	Lili	Freshman	03/12/1995
32238	Brenda	Senior	05/28/1989
86634	James	Freshman	09/20/1999

MySQL Overview

Open-source relational database

Cross platform, can run on Windows, Mac OS, Linux, etc.

Client/Server System



Client: Computer workstations or mobile devices



Server: stores files and database, provides services to the clients



Network: connect the clients and servers together

MySQL Installer

Write "1234pass" or whatever you want but please remember this password for later

MySQL Installer

MySQL Server 8.0.27

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply Configuration

Accounts and Roles

Root Account Password
Enter the password for the root account. Please remember to store this password in a secure place.

MySQL Root Password:

Repeat Password:

Password strength: **Weak**

MySQL User Accounts

Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.

MySQL User Name	Host	User Role
-----------------	------	-----------

Add User

Edit User

Delete

< Back Next > Cancel

MySQL Installer

MySQL Installer

MySQL Server 8.0.27

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Apply Configuration

Windows Service

☒ Configure MySQL Server as a Windows Service

Windows Service Details
Please specify a Windows Service name to be used for this MySQL Server instance. A unique name is required for each instance.

Windows Service Name:

☒ Start the MySQL Server at System Startup

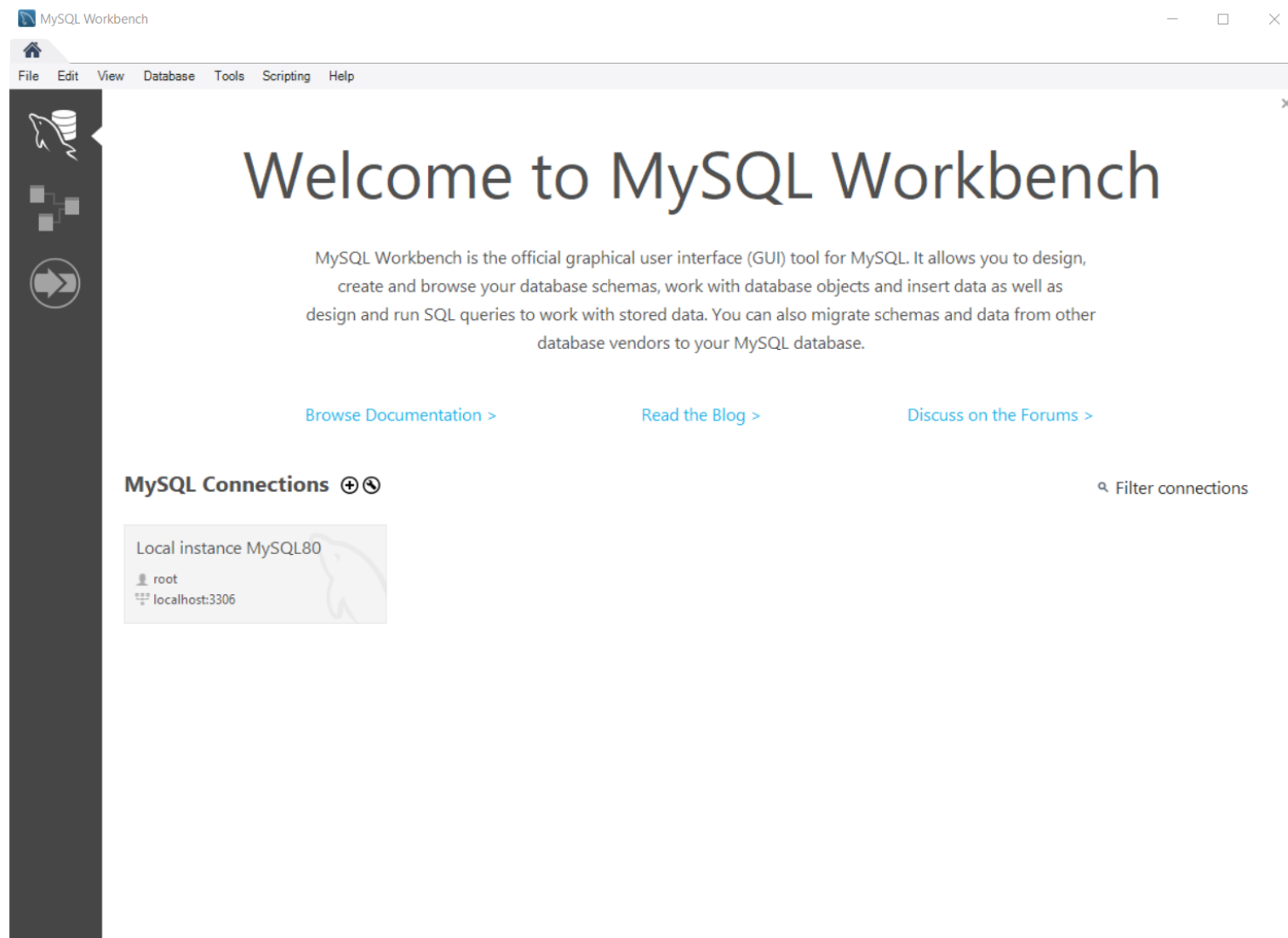
Run Windows Service as ...
The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below.

☒ **Standard System Account**
Recommended for most scenarios.

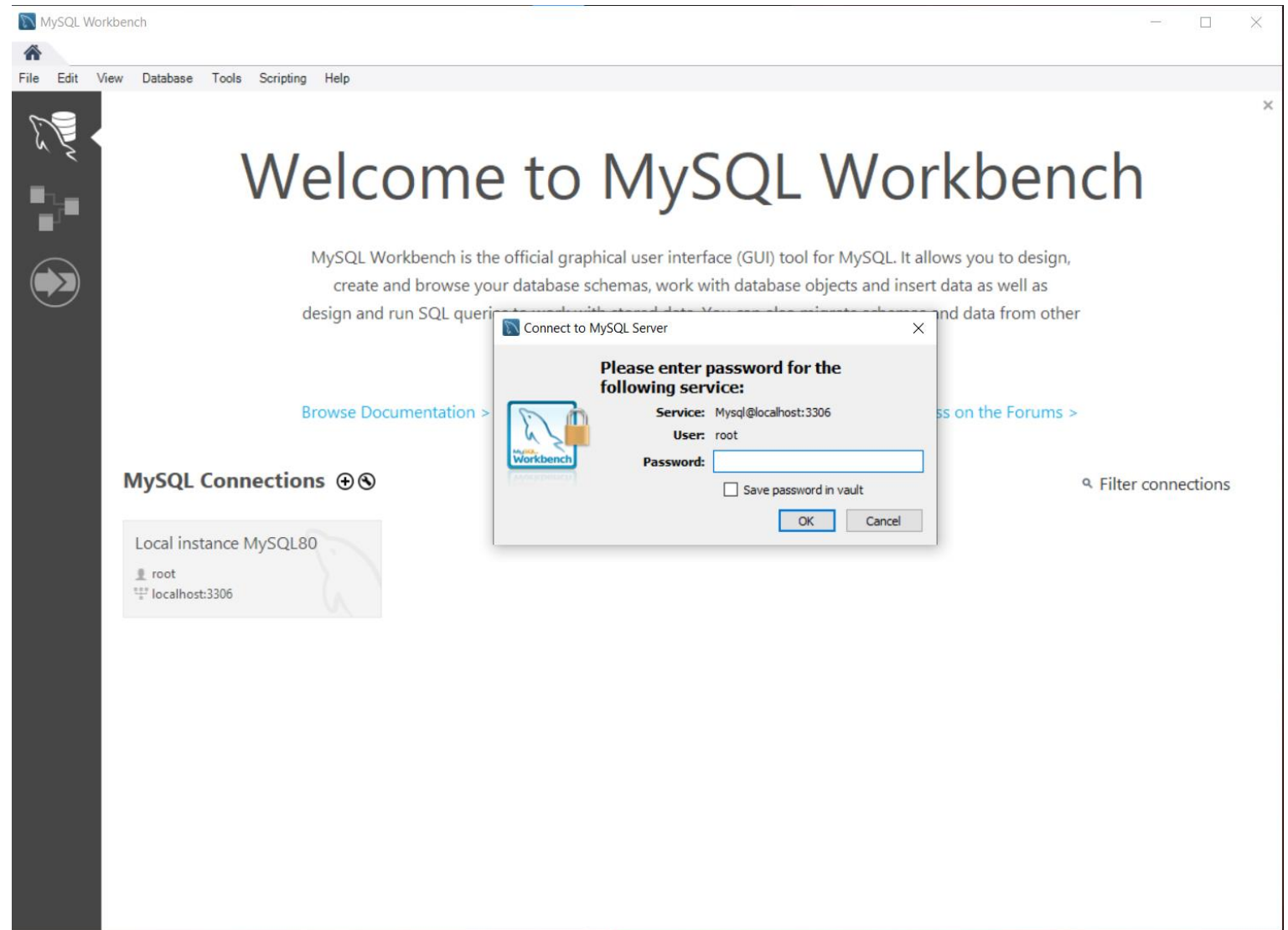
☐ **Custom User**
An existing user account can be selected for advanced scenarios.

< Back Next > Cancel

MySQL



MySQL



MySQL

Admin
settings,
Databases
and Tables

Console
Information

The screenshot shows the MySQL Workbench interface with several red annotations and boxes highlighting specific features:

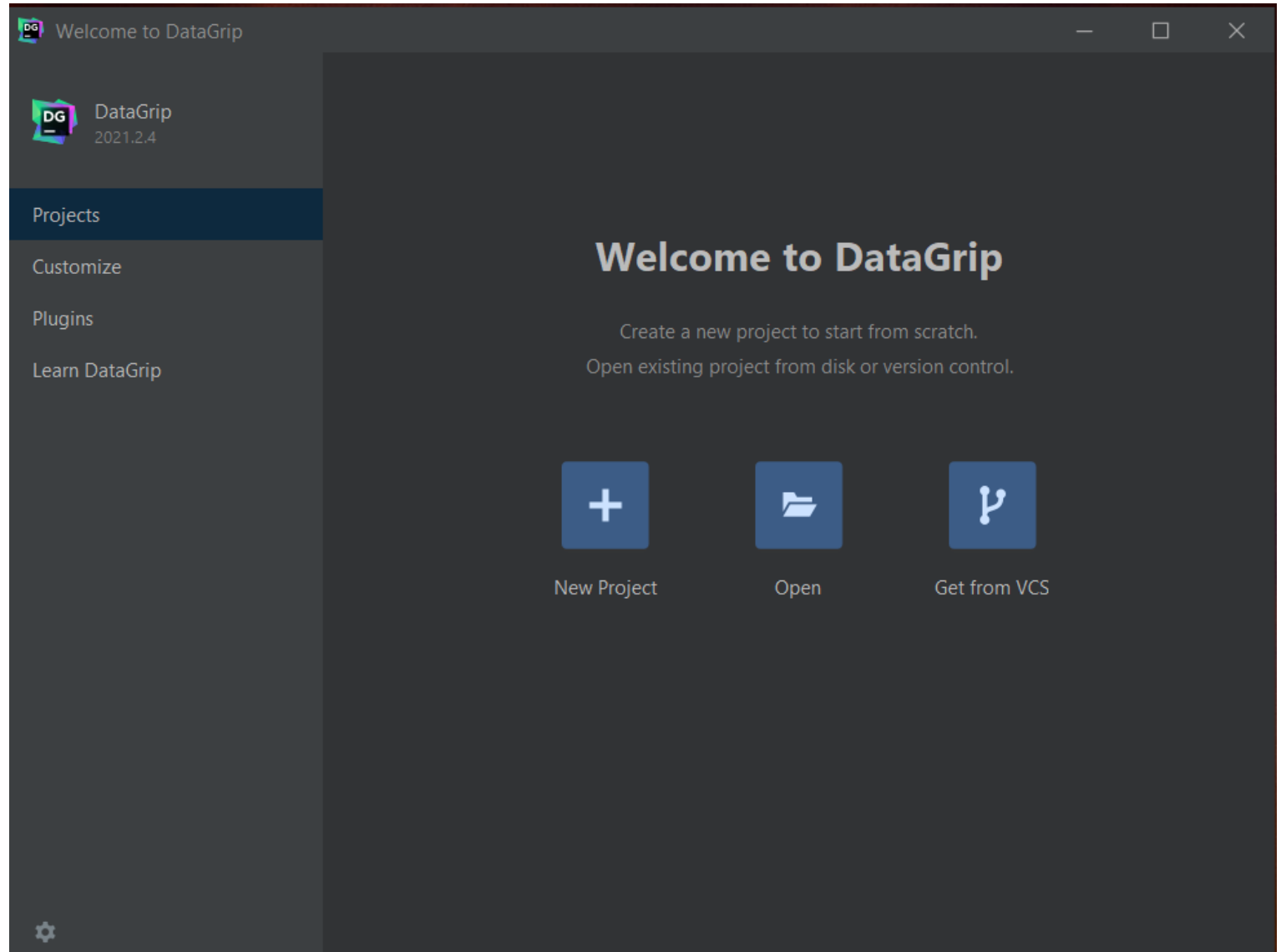
- Text Editor**: Points to the main area where queries are written.
- Where you will write Queries**: Points to the text editor area.
- controls**: Points to the toolbar above the text editor.
- Help Panel**: Points to the SQLAdditions panel on the right.
- View, Results, Execution**: Points to the area below the SQLAdditions panel.
- History of Output**: Points to the Output panel at the bottom.

The interface includes a sidebar with a **Navigator** pane showing categories like **MANAGEMENT** (Server Status, Client Connections, Users and Privileges, Status and System Variables, Data Export, Data Import/Restore), **INSTANCE** (Startup / Shutdown, Server Logs, Options File), and **PERFORMANCE** (Dashboard, Performance Reports, Performance Schema Setup). The main area displays a query editor with a toolbar and a text editor. The right sidebar shows the **SQLAdditions** panel with a message: "Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help." The bottom panel shows the **Output** section with a table header: #, Time, Action, Message, Duration / Fetch.

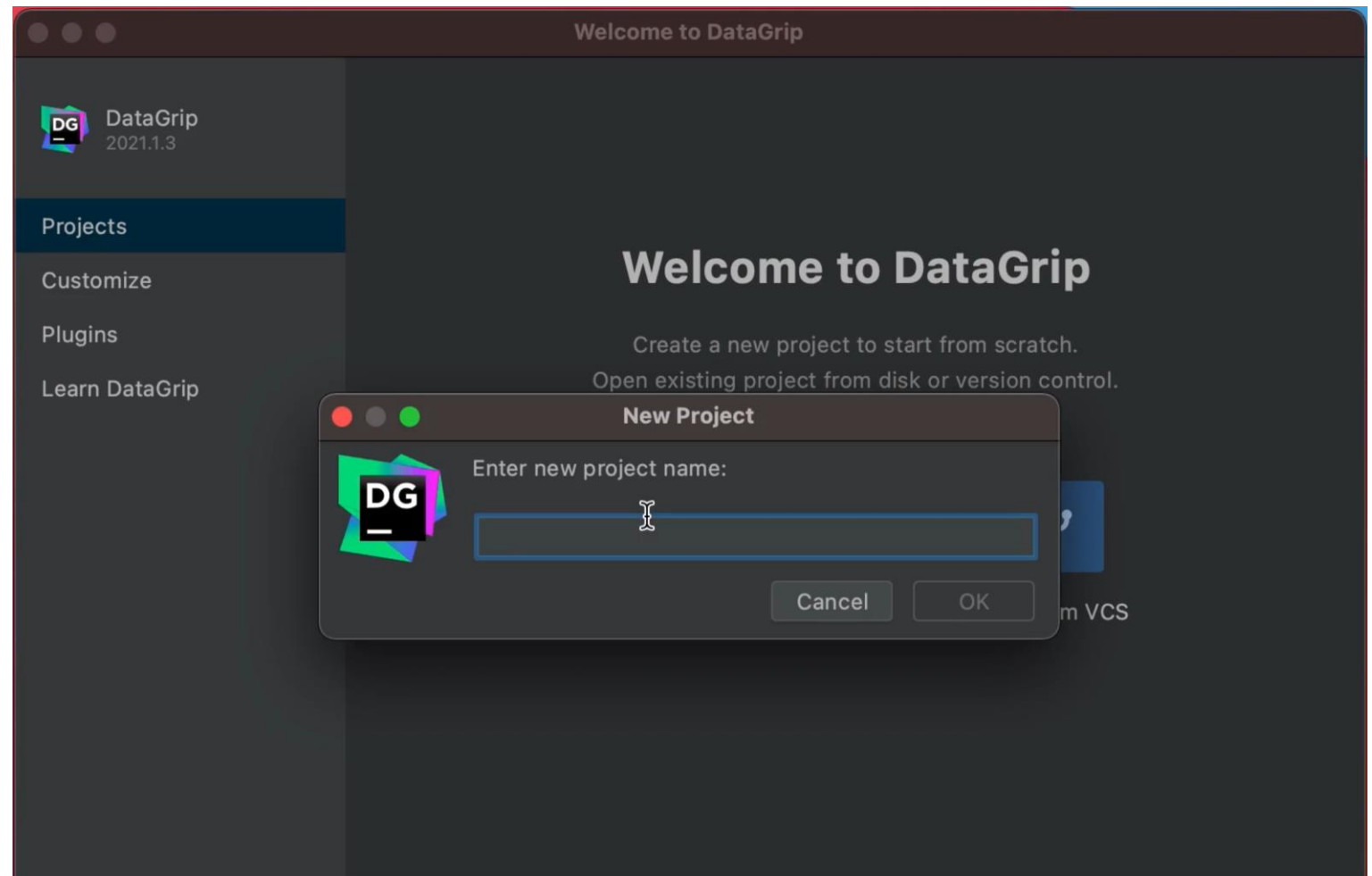
The logo for DataGrip, featuring the text "DataGrip" in a white, sans-serif font. The background is a dark blue gradient with a large, lighter blue circular shape on the right side.

DataGrip

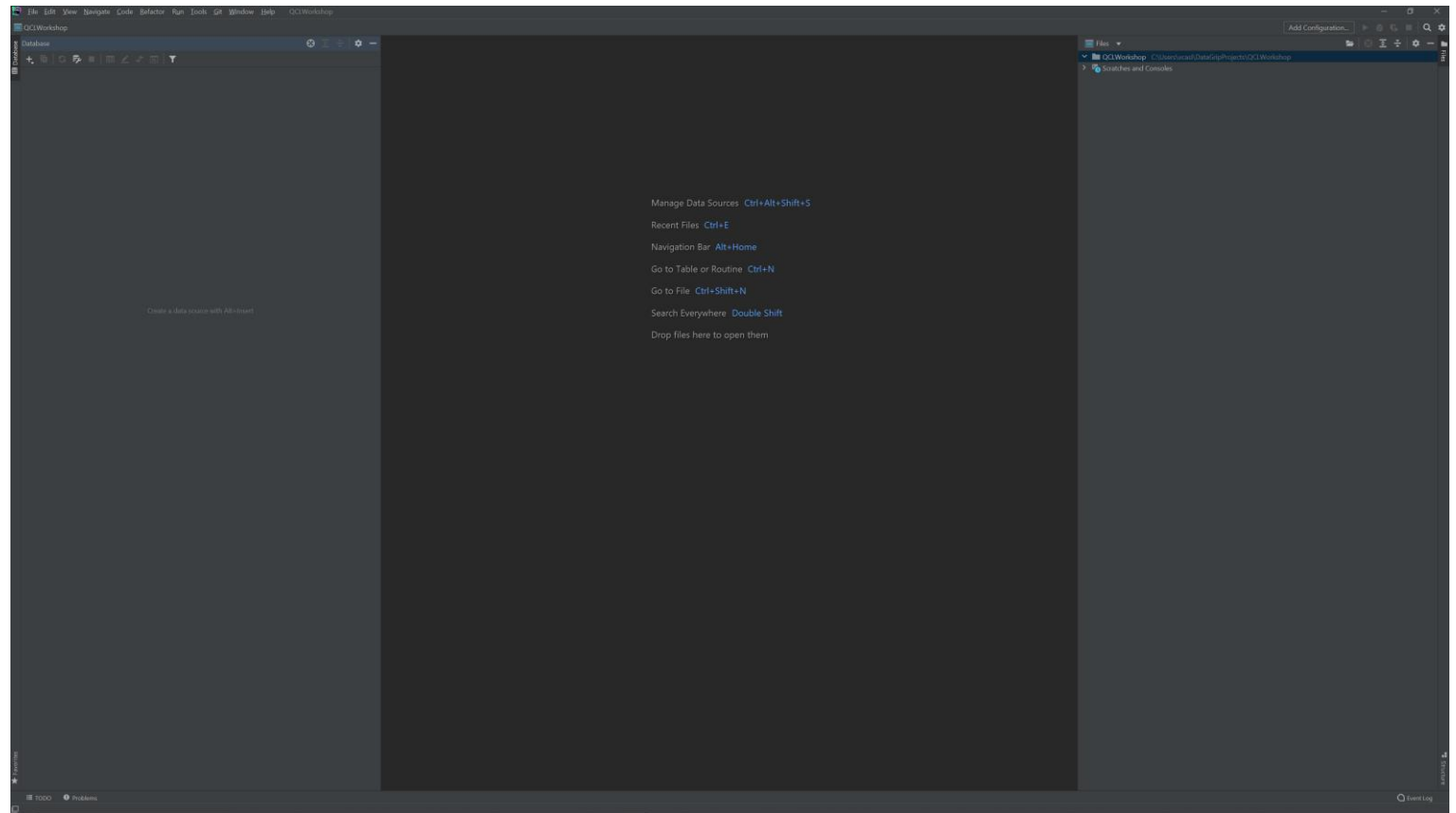
Click New
Project



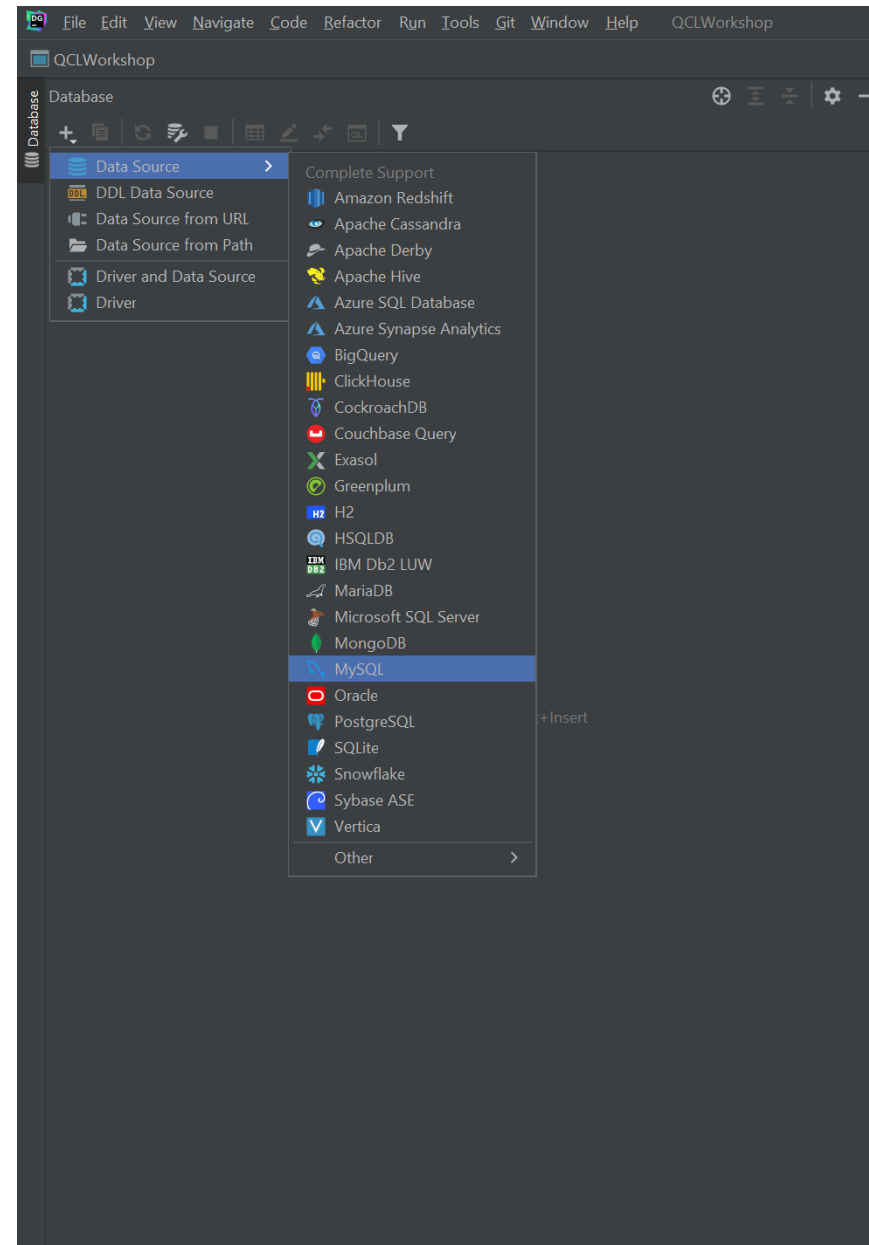
Make new
project called
“QCLWorkshop”



What is look
like when
you have it
setup



Click on the
Plus Sign
Click on Data
Source
Click on MySQL



Fill in User: root
Fill in Password:
1234pass
Test Connection

Password that you made or "1234pass"

Data Sources and Drivers

Data Sources Drivers

Project Data Sources

@localhost

Problems

General Options SSH/SSL Schemas Advanced

Connection type: default Driver: MySQL

Host: localhost Port: 3306

Authentication: User & Password

User: root

Password:

Save: Forever

Database:

URL: jdbc:mysql://localhost:3306
Overrides settings above

Succeeded

DBMS: MySQL (ver. 8.0.27)
Case sensitivity: plain=lower, delimited=lower
Driver: MySQL Connector/J (ver. mysql-connector-java-8.0.25 (Revision: 08be9e9b4cba6aa115f9b27b215887af40b159e0), JDBC4.2)
Ping: 11 ms
SSL: yes

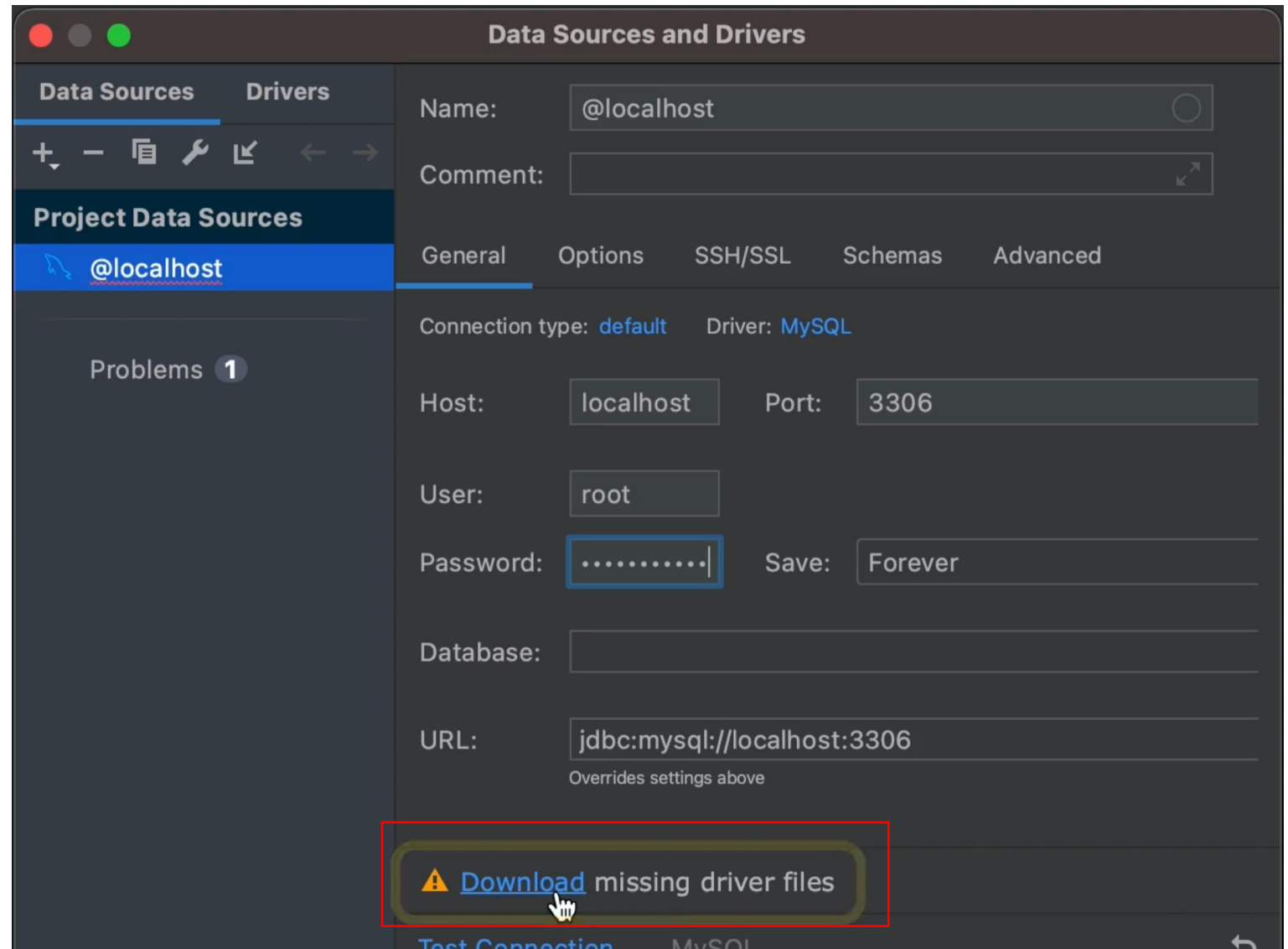
Copy

Test Connection ✓ MySQL 8.0.27

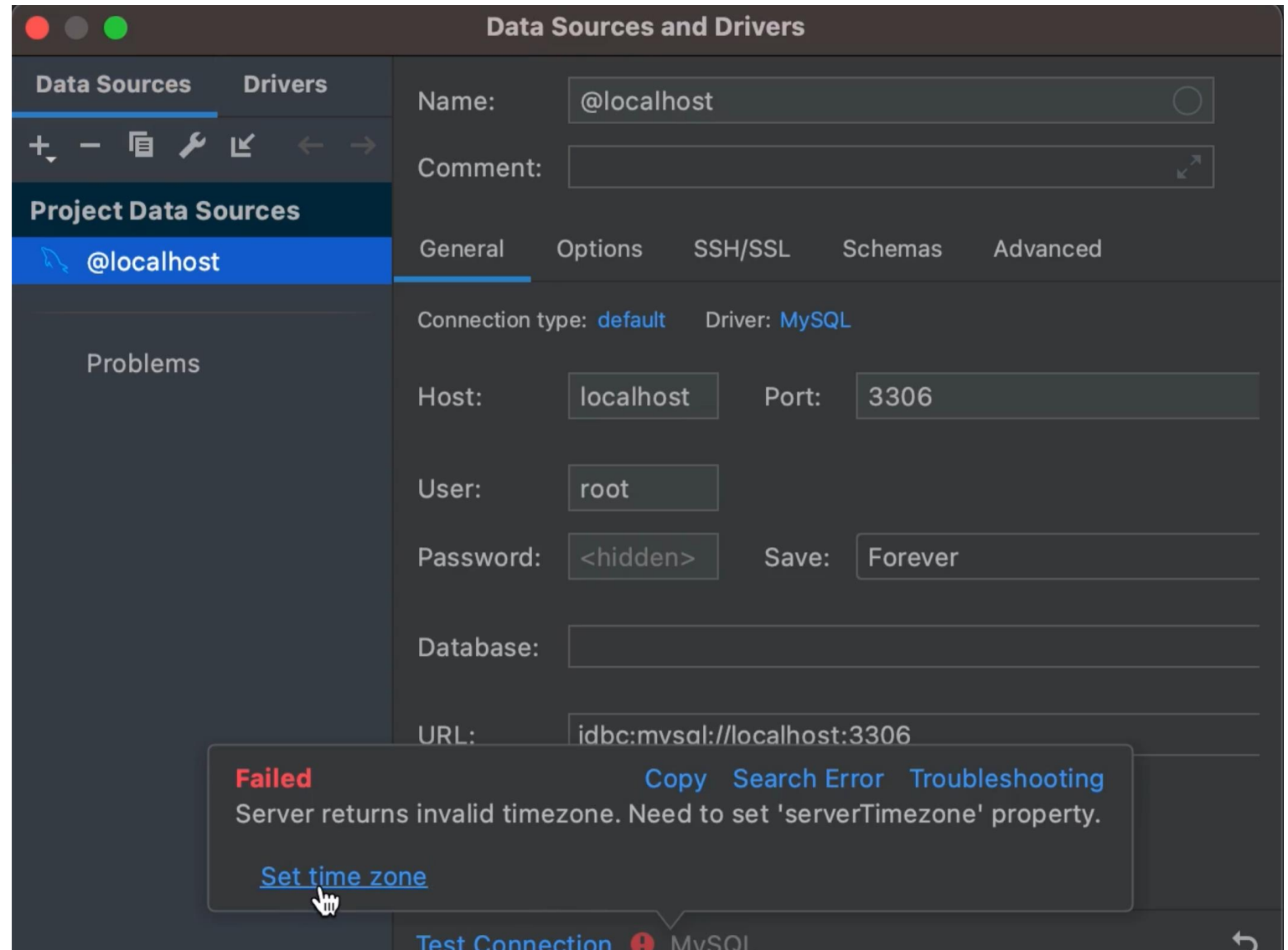
OK Cancel Apply

If you have any
errors, please make
sure to contact
gcl@cmc.edu before
the day of the
workshop!

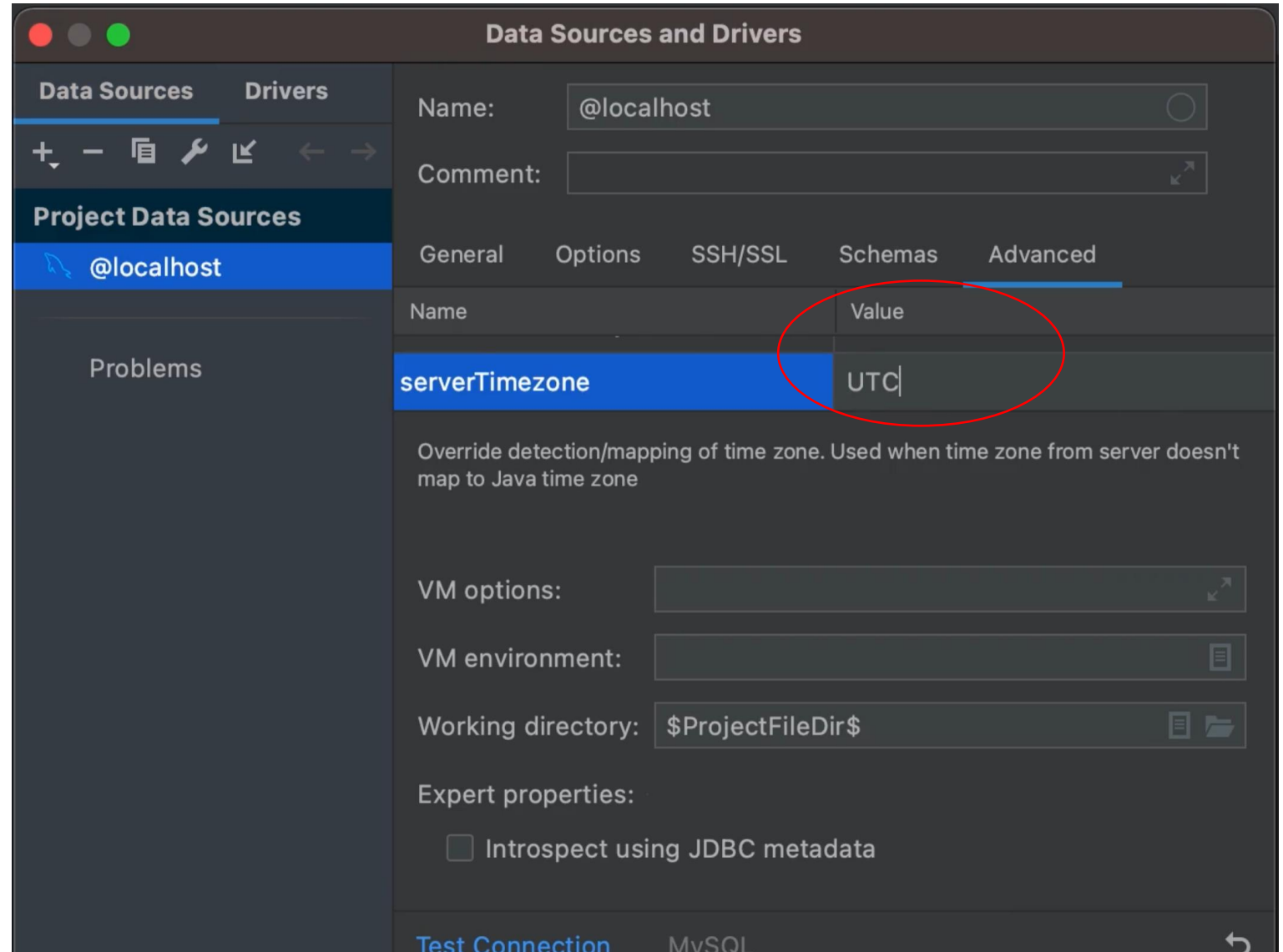
Download
missing
driver files



If you get
time zone
error

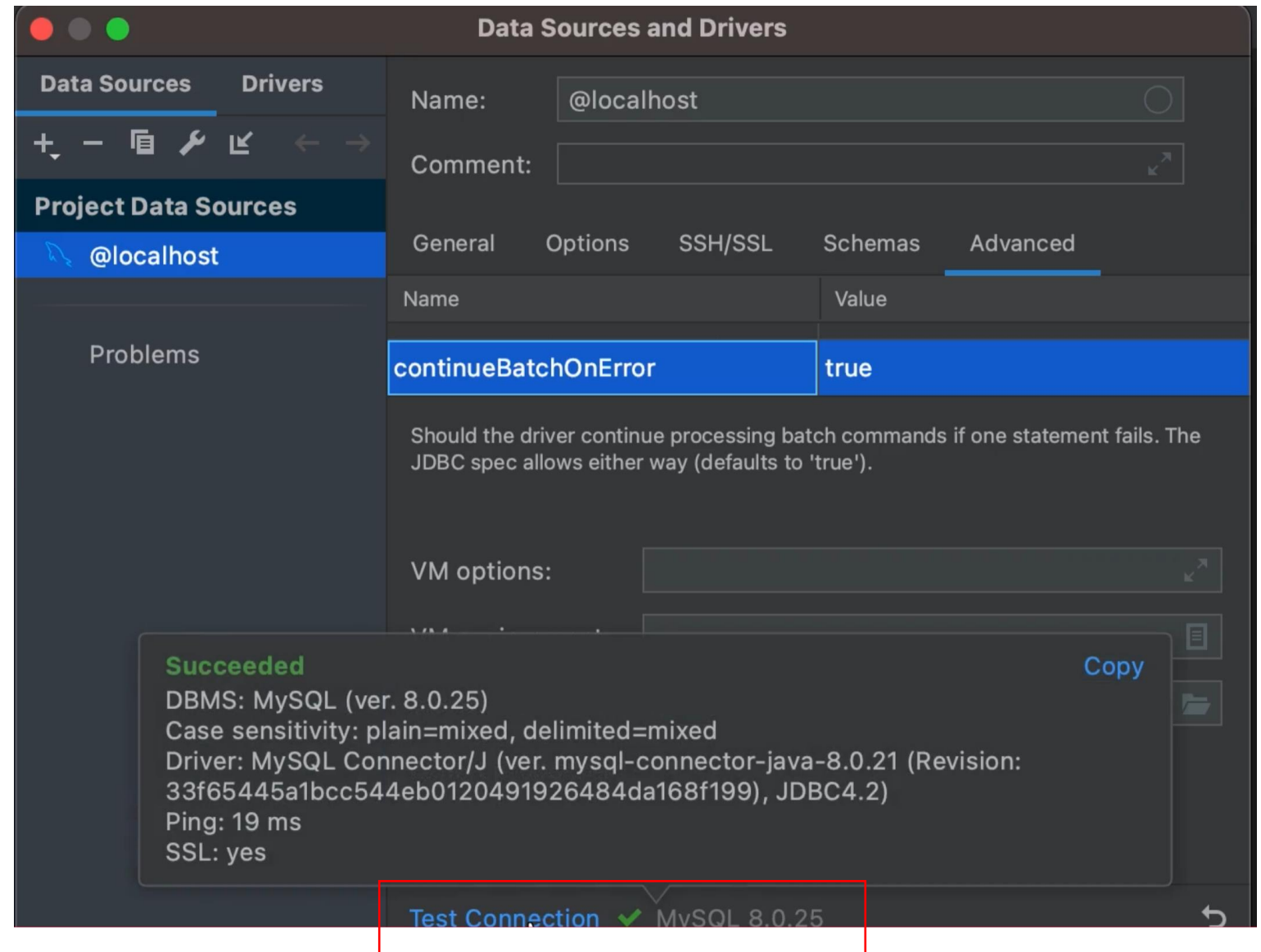


Put UTC is
the value
box, push
tab button
on keyboard

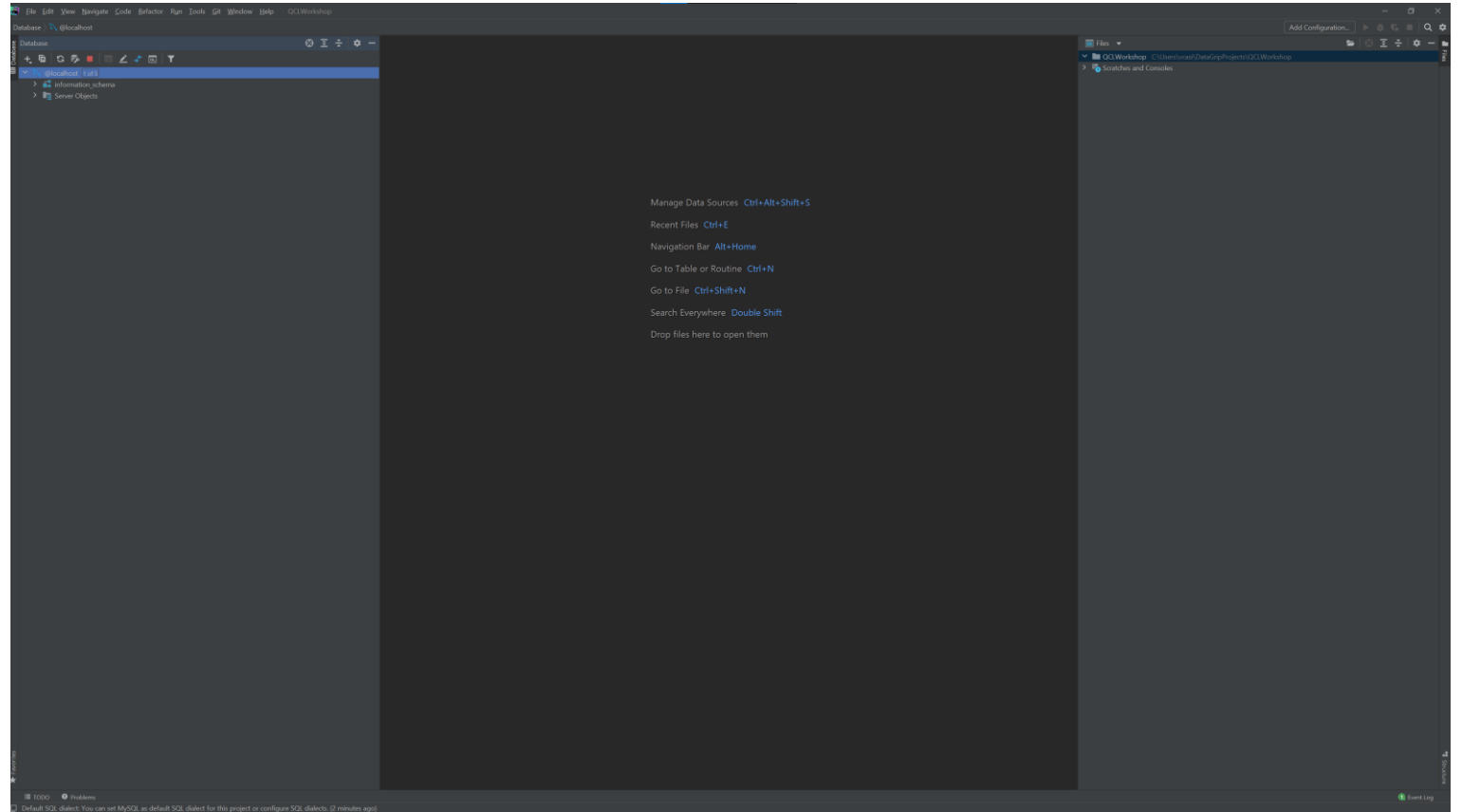


Test Connection

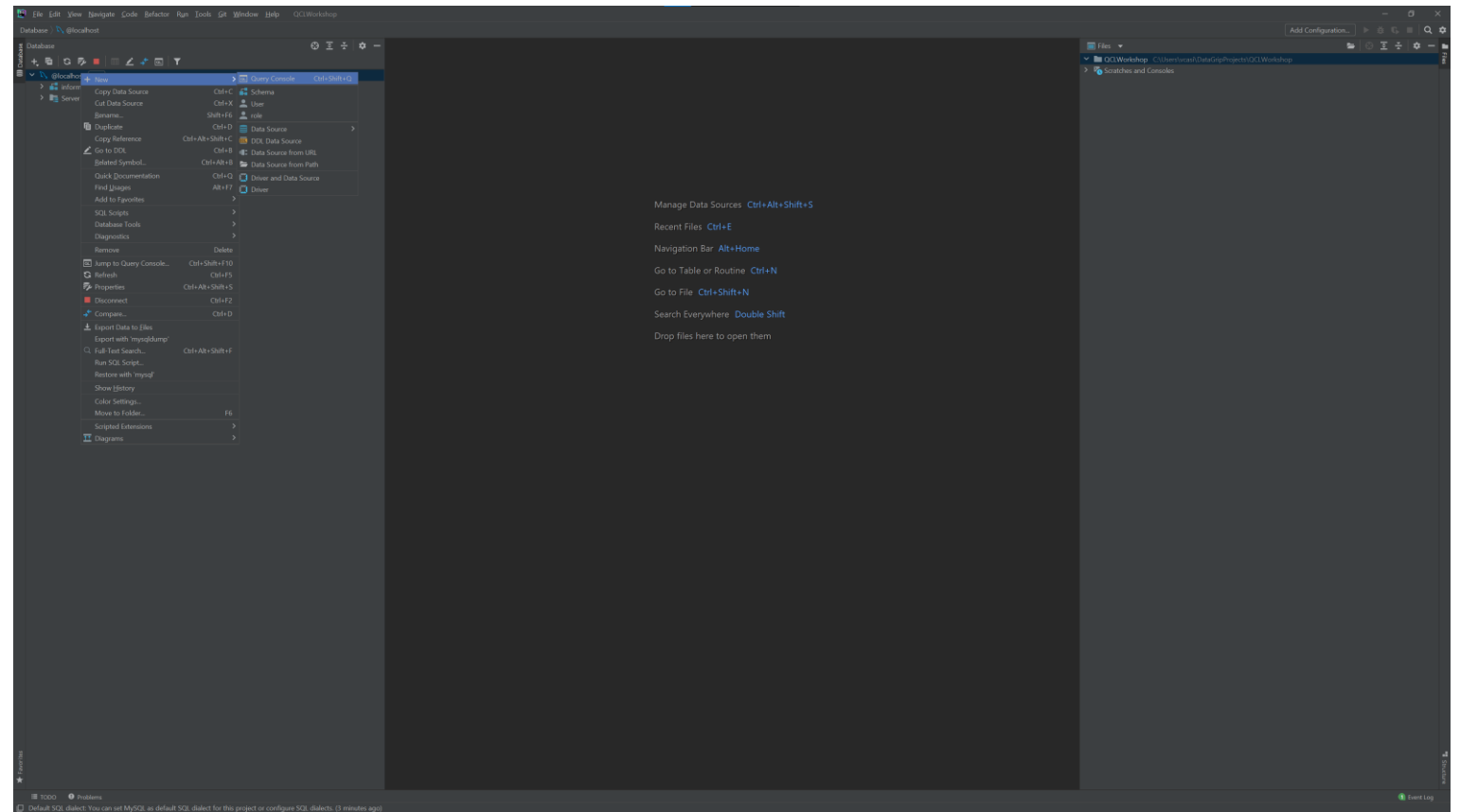
If you have any other errors, please make sure to contact gcl@cmc.edu before the day of the workshop!



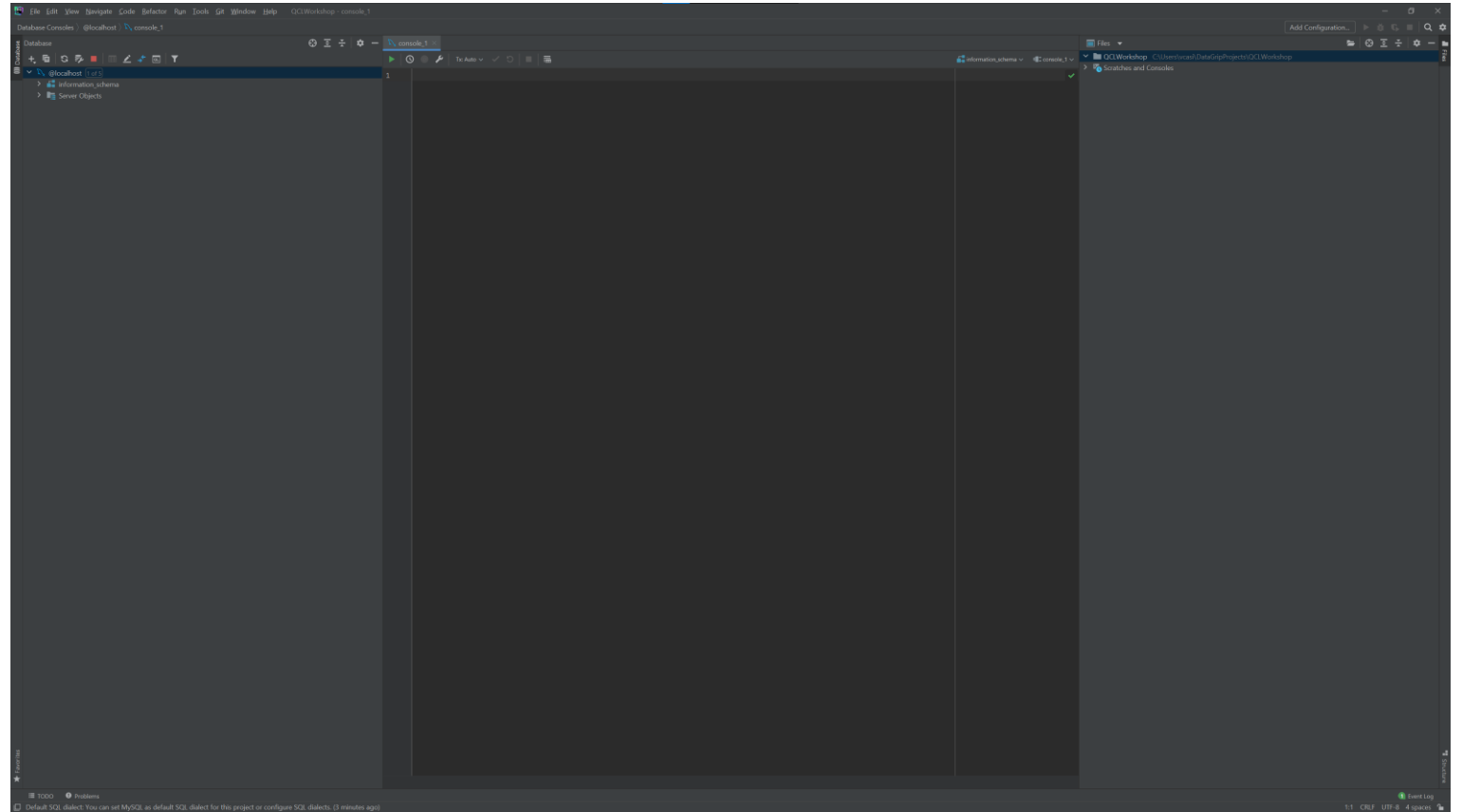
See the
Sever on the
left-hand
side



Right click
Click new
Click Query
Console



You are
ready to
type out
queries



Connect Database

Databases and Tables

Console Information

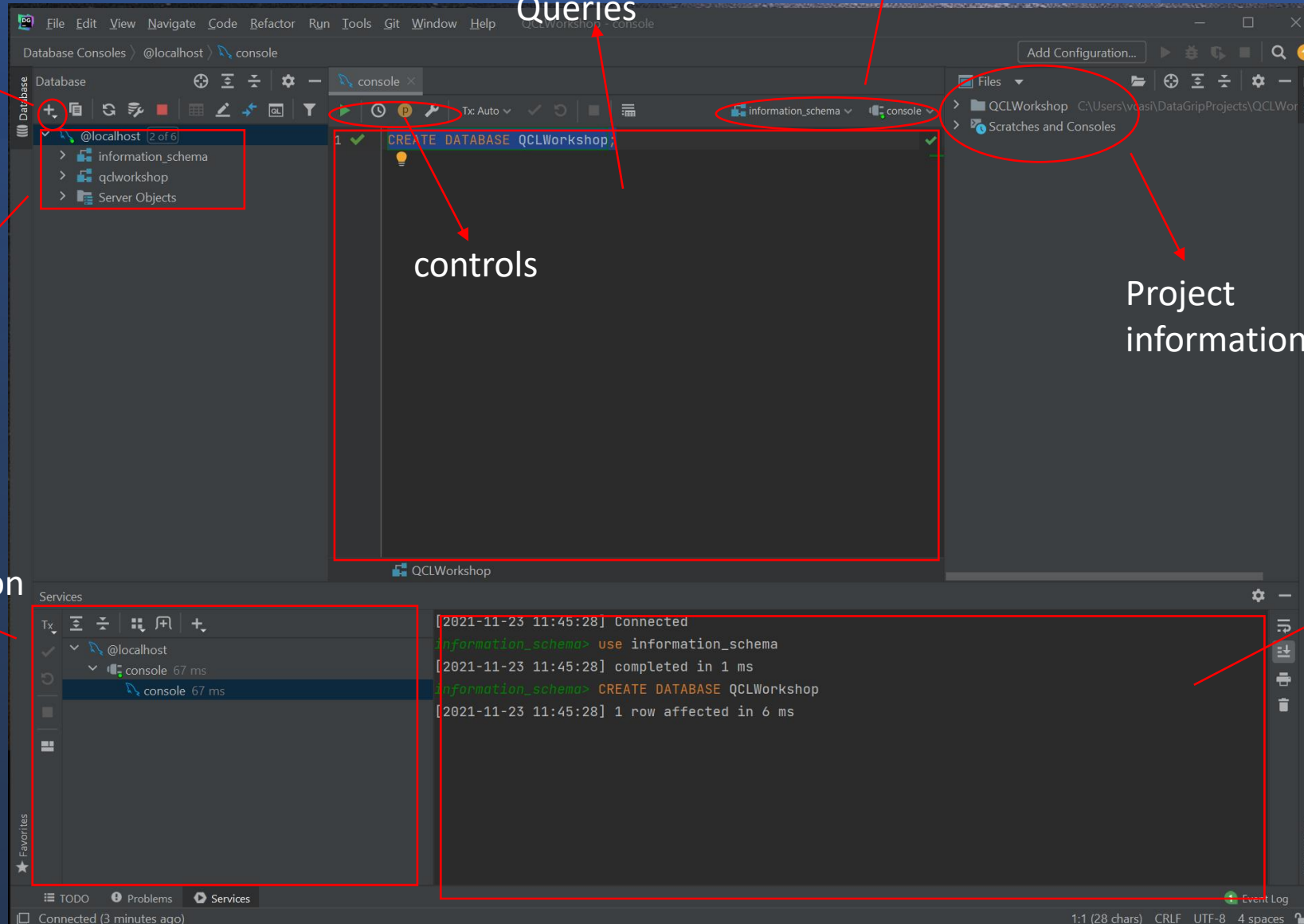
Text Editor
Where you
will write
Queries

Choose your
data base

controls

Project
information

View, Results,
Execution



SQL Part 2

- Make sure to bring:
 - Computer
 - MySQL downloaded and setup
 - DataGrip downloaded and setup
- Agenda
 - SQL Overview
 - Review
 - Basic SQL Statements
 - SQL Database Query Difference
 - DataGrip
 - Basics SQL Commands Hands-on
 - Operation Order
 - Resources
 - Contact Info